DOCUMENT RESUME

ED 102 448 CG 009 516

AUTHOR Crockenberg, Susan B.; And Others
TITLE The Effects of Cooperatively and Competitively Structured Learning Environments on Intrapersonal Behavior.
PUB DATE Aug 74
NOTE 30p.; Paper presented at the Annual Meeting of the American Psychological Association (82nd, New Orleans, Louisiana, August 1974)
AVAILABLE FROM Susan Crockenberg, Department of Applied Behavioral Sciences, University of California, Davis, California 95616

EDRS PRICE MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS Behavior Patterns; *Children; Elementary Education; Failure Factors; Goal Orientation; *Group Dynamics; *Learning Experience; Research Projects; Speeches; *Success Factors; Teaching Methods

ABSTRACT

This study examined the effects of cooperative and competitive goal structures on children's evaluations of the learning experience and on children's self-reward. Fourth-graders (n=180) were assigned to learning groups of three children each by a stratified (sex and ability) random sampling procedure. Groups were assigned to either the group (cooperative) or individual (competitive) condition. Cooperative subjects worked together on a project, and all were rewarded for their efforts. Competitive subjects worked independently and only one randomly selected "winner" was rewarded. The effects of "failure" and of "success" depended on a number of variables other than the amount of reward received; for example, on whether the subject saw the reward as deserved and the distribution of rewards as fair. The author notes that one goal for future research in this area is to define these modifying circumstances more specifically. (Author/PC)

BEST COPY AVAILABLE

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED102448

THE EFFECTS OF COOPERATIVELY AND COMPETITIVELY STRUCTURED LEARNING ENVIRONMENTS ON INTRAPERSONAL BEHAVIOR

Susan B. Crockenberg, Brenda K. Bryant, & Lee S. Wilce

University of California, Davis

Paper presented at the annual meetings of the American Psychological Association, New Orleans, September, 1974.

CG 009 516

BEST COPY AVAILABLE

THE EFFECTS OF COOPERATIVELY AND COMPETITIVELY STRUCTURED LEARNING ENVIRONMENTS ON INTRAPERSONAL BEHAVIOR

Susan B. Crockenberg, Brenda K. Bryant, & Lee S. Wilce[1]

University of California, Davis

The focus of this presentation is the effect of learning environment structure on intrapersonal behavior. Specifically, this study examines the effects of cooperative and competitive goal structures on children's evaluations of the learning experience and on children's self-reward.

Deutsch (1962) describes a cooperative situation as one in which "the goals of the separate individuals are so linked that there is a positive correlation between their goal attainments," and a competitive situation as one in which "the goals of the separate individuals are so linked that there is a negative correlation between their goal attainments (p. 276)." In discussing the psychological consequences of cooperative and competitive situations, Deutsch (1962) focuses rather exclusively on relationships with others. He predicts that a person in a cooperative situation will like the others in the group (positive cathexis); will do things to assist other group members (inducibility); and will show less overlap in activity (substitutibility). A series of studies reviewed by Deutsch (1962) and Johnson & Johnson (1974) support these predictions.

Likewise, it seems reasonable that individuals will enjoy themselves more and feel better about themselves in an environment where there is greater feeling of liking and of being liked by others, more helping and more friendliness. In fact, research shows that college students in cooperative situations indicate greater satisfaction with their experience than students in competitive situations (Deutsch, 1949). Similarly, recent studies (DeVries & Edwards, 1972; Johnson, Johnson & Bryant, 1973; Johnson & Ellison, 1973; Johnson, 1973) have found that elementary and high school age students prefer

cooperatively structured learning environments to competitive ones, implying a greater personal satisfaction with the cooperative experience.

In addition, there is evidence that students in competitive environments are more anxious (Naught & Newman, 1966); less self-assured (Haines & McKeachie, 1967); and less secure (Deutsch, 1949)--all states that we can reasonably label unpleasant.

But beyond feelings of enjoyment or dissatisfaction, are there more significant consequences for the individual who experiences cooperative or competitive environments? Is it reasonable to think that a child internalizes something about himself based on his experiences with others? Psychologists since the time of G. H. Mead (1934) have contended that a person develops a sense of who he is and what he is worth by incorporating the feedback from his environment. And as Johnson and Johnson (1974) illustrate, the conditions of success and failure are quite different in cooperative and competitive environments.

> Since every group member contributes in some way to accomplishing the goal, all individuals in a cooperative structure potentially will have a success experience. But, since there can be only one "winner" in a competitive goal structure, the vast majority of students will experience failure (p. 16).

What are the consequences of failure? The answer undoubtedly depends on such things as the importance of the task to the child, the shared affective experiences following failure, and the consistency with which failure is experienced. As Mischel (1968) notes, the effects of any independent variable will depend on a variety of additional conditions that may alter or modify the effect in some way. Nonetheless, both psychological theory and everyday experience suggest that if a person repeatedly receives feedback that he is incompetent he usually begins to believe it. And even when he hears only that someone else has succeeded and by implication he has not, the message for him is

often the same as when the feedback is more direct; he is still a loser.

There are various methods of determining the effects of winning or losing on the individual. One could, for example, ask a child direct experiential questions following failure such as, "How good a job did you do on ---?" Less directly, one can observe behavior elicited in subsequent experiences. For example, opportunity to reward self following success and failure can be examined. A series of recent studies have shown that prior success or failure experiences influence children's subsequent level of self-reward (Masters, 1971; Masters, 1972; Masters & Peskay, 1972; Mischel, Coates & Raskoff, 1968). Initially, self-reward was assumed to be a measure of self-congratulation or self-punishment. Mischel et al. (1968) interpreted self-reward as reflecting strong positive feelings or enhanced self esteem. It was therefore expected to be high after success and low after failure. However, a study by Bandura and Whalen (1966) indicated that when reward following failure was noncontingent, failure as well as success increased self-reward. Consistent with the idea that self-reward reflects feeling states, this increase of self-reward following failure was interpreted as "self-therapy."

Subsequent research on the effects of success and failure on self-reward have produced conflicting results. Whereas Mischel et al. (1968) found that prior success but not failure increased subsequent noncontingent self-gratification, Masters (1972) found that prior failure as well as success increased subsequent noncontingent gratification. In Mischel et al.'s (1968) study, children were given success experiences by means of verbal feedback concerning their own performance upon a task which gives a comparison of one's performance level to the typical performance of a reference group, boys (girls) of their age. In Masters' (1972) study, not only was normative information concerning success or failure given, externally administered

reinforcements were given or withheld. Thus, failure experiences lead to "self-therapy" when normative information and external, concrete reinforcement defines success and failure. More fully, Masters found that following success on a task, children increased both contingent and noncontingent self-reinforcement; following failure children increased their self-reinforcement as well, but only noncontingently, unless the task was dissimilar to the one on which failure was experienced. In the case of a dissimilar task following failure, both contingent and noncontingent self-reinforcement increased. The implication of this study would appear to be that self-reward following success or failure would not discriminate groups given that the task for which self-reinforcement was given differed from the task on which failure was experienced. Winners would reward themselves because they felt they deserved it; nonwinners because they felt they needed it. On the other hand, one could argue that failure that is public, in other words experienced in front of others and in comparison to real-life others as opposed to a relatively unknown experimenter, is more devastating and therefore more likely to arouse the need for self-therapy. In fact, Masters (1971) found that children rewarded themselves more generously following an experience when they received less than a peer but showed no change in self-reward behavior following an experience when they received more than a peer. The implication here is that self-reward under the above conditions would lead to greater self-reward after failure (losing) than after success (winning).

There is also the possibility that winning and losing in a competitive situation are experienced differently by the two sexes. Research by M. Mead (1949) and Horner (1971) suggests that females fear success because success frequently means another fails and such behavior is viewed as "competitively aggressive," and therefore "unfeminine." In addition, although

comparative studies of parental treatment of boys and girls are not extensive, those that have been made indicate that boys are subjected to more achievement demands and higher expectations than are girls (Sears, Maccoby & Levin, 1957; Barry, Bacon & Child, 1957). Thus, it would appear that not winning in a competitive situation would be less devastating for the girls than for the boys. And as a consequence girls would have less need for self-therapeutic reward.

Masters (1972) provides some support for this prediction. He reports a marginally significant tendency for the boys to show greater self-reinforcement than girls following an experience where the children were told that they received fewer rewards than most children their age. One would expect these sex differences to be even greater when peers are actually present when winners and (by implication) nonwinners are identified by the experimenter and the external rewards are given or withheld in the presence of peers.

What about cooperative winners, those who work together on a task, and who are each rewarded for the groups' accomplishment? Previous research (Johnson & Johnson, 1974) suggests that they will evaluate the learning experience more positively than subjects in the competitive condition, although it is not clear what the differences will look like when competitive condition subjects are separated into winners and losers. The expectation with respect to self-reward by cooperative winners is even less clear. Because they experience success, cooperative winners might behave like the competitive winners, if receiving the reward--experiencing success--is the critical variable. But what is success? Growing up in a competitive culture where success is frequently not simply a matter of one's own achievement but of outdoing another, a situation where everyone wins may be viewed as less of a success for the individual. As a consequence the cooperative winner may be less likely

than the competitive winner to congratulate himself, less likely to self-reward.

On the basis of the foregoing review it is predicted that in comparison with competitive winners, competitive losers will enjoy the learning experience less; see themselves as less competent in terms of task performance; and see the teacher's evaluation of them as more negative. With respect to self-reward, it is predicted that competitive losers will reward themselves more than competitive winners, and that this will hold to a greater extent for boys than for girls. Cooperative winners are expected to reward themselves somewhat less and to evaluate their experience somewhat less highly than competitive winners, but more highly than competitive nonwinners.

Method

Subjects

One hundred and eighty fourth-graders (90 boys and 90 girls) participated in this study. The children attended three elementary schools in a rural-suburban school district of northern California.[2]

Teachers provided information on ethnicity and rated each child's reading ability as high, medium or low. Only Caucasians were selected for further study. The children were assigned to learning groups of three children by a stratified (sex and ability) random sampling procedure. Then groups were randomly assigned to either the group (cooperative) or individual (competitive) condition, such that proportional numbers of each sex and each ability group were represented in each condition.

Conditions

Cooperative condition. Ss worked together as a group to make up a story, and all were rewarded for their efforts.

Two competitive conditions. Ss worked independently. Each child wrote his own story, and only one child (a randomly chosen "winner") was rewarded

for his efforts. This experience yielded two conditions--a winning condition and a nonwinning condition.

Procedure

Experimental condition. Prior to the project the Ss were introduced to the female E; they were told that she would be their teacher in a special writing project. Each group of three Ss was taken by the E to a private room on two consecutive days, one half hour the first day, an hour the second.

On Day 1 the Ss were told that this was their practice day. They were asked to make up a story about a picture they were shown, working together (Cooperative Condition) or independently (Competitive Condition). After the story writing (a maximum of 15 minutes was allowed), the E read the story/stories and praised the Cooperative Condition subjects for working together and writing a good story. In the Competitive Condition, the E praised the randomly selected "winner" for having written the best story. Then the E reminded them that they would write another story the next day. In the Cooperative Condition the children were told that they would all get prizes if they worked well together and wrote another good story on the following day. In the Competitive Condition the children were told that whoever wrote the best story the next day would get some prizes (shown by the E). Finally, the E also said she would write reports to their teacher about how they did in the writing project.

Day 2 replicated the procedures of Day 1 except that prior to writing, the E told the Ss to draw pictures while she got ready. Following the writing lesson, Ss watched the E write out report cards for the classroom teacher.

Post-experimental condition. Immediately after the experimental condition the E administered the following measures:[3] a prize-giving task (Crockenberg

& Bryant, 1973) in which children were asked to indicate (privately) how many prizes (1-10) they wanted to give to each group member, including themselves, for the picture that had been drawn at the beginning of Day 2 procedures; and a toy take-away task (Kagan & Madsen, 1972) in which each of two children played against the third. The game involved either moving a marker to the toy, in which case the player took the toy away from the other child but could not keep the toy himself, or moving the marker away from the toy in which case the other player kept the toy.

After all the children had participated in the "special writing project," the E returned to each class and administered a follow-up measure, a seven item questionnaire using a four point scale, in which the Ss were asked to evaluate the writing class, including the E and their own work.[4] All items were scored in such a way that the higher the score, the more positive, enjoyable, and easy the evaluation. Finally, the children who received prize tickets for their work in the special writing project were given an opportunity to exchange their tickets for a variety of 10-cent toys.

Results

Personal Evaluation of the Learning Experience

Means for the total evaluation score (sum of the seven items on the evaluation questionnaire) and means of individual items are shown in Table 1.

Insert Table 1 about here

F tests shown in Table 2 comparing the variances for individual items and total score on the evaluation questionnaire indicate significant differences in variances for boring, fun, fair, and total score.

Insert Table 2 about here

The variance for the cooperation winners group is consistently larger than the variance for the competition winners. Likewise, the variance for the competition nonwinners is larger than the variance for the competition winners. No significant differences of variance are found between the competition nonwinners and cooperation winners.

Because there was some heterogeneity among the individual group variances, nonparametric analyses were employed for all items. Results of two-way Kruskal-Wallis tests are shown in Table 3.

Insert Table 3 about here

In sum, condition effects were found for total score and all items, except "easy" and "pleasant." Sex effects were found for "fair," and "self evaluation." Sex-by-condition interactions were found for total score and all items except "child's perception of teacher evaluation." Comparisons using the Mann-Whitney test (using one-tailed tests for predicted comparisons between conditions and two-tailed tests for unpredicted sex and sex-by-condition interaction comparisons) indicate:

a. Total score: Competition winners evaluated the learning experience more highly than both competition nonwinners ($U = 128.00$, $p < .001$) and cooperation winners ($U = 379.50$, $p < .03$). And cooperation winners evaluated the experience more favorably than competition nonwinners ($U = 388.50$, $p < .01$).

b. Boring: Although competition winners viewed their learning experience as significantly less boring than either cooperation winners ($U = 376.50$,

$p < .008$) or competition nonwinners ($U = 259.00$, $p < .002$) examination of the sex-by-condition interaction revealed that these differences were accounted for totally by the males ($U = 350.00$, $p < .008$; $U = 375.50$, $p < .007$, respectively). Females did not differ across condition in their perceptions of the learning experience as more or less boring.

c. Fun: Similarly, competition winners perceived the class as more fun than competition nonwinners ($U = 237.00$, $p < .003$), but again boys only accounted for this difference ($U = 300.00$, $p < .002$).

d. Easy: Using two-tailed Mann-Whitney U tests only one significant interaction was observed with competition winner males perceiving the learning experience as easier than competition nonwinner females ($U = 287.00$, $p < .04$).

e. Pleasant: Using two-tailed Mann-Whitney U tests, one nearly significant contrast was observed with competition winner males perceiving the learning experience as more pleasant than competition nonwinner males ($U = 312.00$, $p < .06$).

f. Fair: Competition winners perceived the class as more fair than did competition nonwinners ($U = 230.00$, $p < .003$), a finding that was supported by males ($U = 265.50$, $p < .02$). Competition winners also viewed the learning experience as more fair than did cooperative winners ($U = 365.00$, $p < .05$), a difference that was again due entirely to differences between males in the two conditions ($U = 364.00$, $p < .05$). In the cooperative condition females view their experience as significantly more fair than males ($U = 534.50$, $p < .02$).

g. Self-evaluation: Competition winners evaluated their own performance higher than did competition nonwinners ($U = 230.50$, $p < .003$) and cooperation winners evaluated their performance higher than did competition nonwinners ($U = 389.00$, $p < .008$). Competition and cooperation winners did not differ

significantly in self evaluation. However, inspection of the sex-by-condition interaction data indicates that females only account for the difference in self-evaluation between competition winners and nonwinners (U = 225.00, p < .004). Males in the two competitive conditions do not differ significantly in self-evaluation. In addition, males only account for the difference in self-evaluation between cooperation winners and competition nonwinners (U = 375.50, p < .01). Females in the cooperative winner and competition nonwinner condition did not differ significantly in self-evaluation. Finally, in both the cooperative winner condition and the competition nonwinner condition males evaluated their performance more highly than did females (U = 232.50, p < .002; U = 605.00, p < .05).

h. Teacher Evaluation: Competition winners of both sexes see the teacher's evaluation as higher than do competition nonwinners (U = 157.00, p < .001). Similarly, cooperation winners see the teacher's evaluation as higher than do competition nonwinners (U = 308.00, p < .001). Cooperation and competition winners do not differ significantly in how they view the teacher's evaluation.

Self reward

Table 4 presents the mean number of prizes awarded to self by cooperation winners, competition winners, and competition nonwinners. Table 5 shows the analysis of variance results, indicating no condition effect but indicating a sex effect qualified by a sex-by-condition interaction. Scheffé contrasts indicate that boys in both the cooperation winner and competition nonwinner conditions give more self reward than girls in the same conditions (p < .05).

Insert Tables 4 & 5 about here

Prizes Given to Self Minus Prizes Given to Others

To further clarify the nature of self reward, giving to self relative to giving to others was examined. A difference score was obtained by subtracting the number of prizes given to one other in the "writing class" from the number of prizes given to self. Four such scores were obtained: one score for cooperation winners, one for competition winners, and two scores for competition nonwinners: 1) comparing prizes to competition winner and prizes to self and 2) comparing prizes to other competition nonwinner and prizes to self. These difference scores do not reflect the actual magnitude of giving to self or giving to others. Rather, a positive score indicates giving more to self than another and a negative score indicates giving more to another than to self. Table 6 presents means for four possible difference scores. Table 7 presents the analysis of variance for difference scores of cooperation winners, competition winners, and competition nonwinners (comparison of self with winner).

Insert Tables 6 & 7 about here

Scheffé contrasts indicate that in two conditions, cooperation winners and competition nonwinners, boys have significantly higher, more positive difference scores than girls ($p < .05$).

In addition, Scheffe contrasts ($p < .05$) indicate that competition winner girls had significantly higher, more positive difference scores than the competition nonwinner girls under consideration. More specifically, the female mean difference score of competition winners is positive with these girls giving more to self than to others. For competitive nonwinners, the female mean difference score is negative with these girls giving more to others

than to self. The mean difference score for cooperation winner girls fell between the mean difference scores of girls in the two competition conditions and failed to differ significantly from either.

To examine the two difference scores obtained from competition nonwinners (prizes to self minus prizes to winner; prizes to self minus prizes to nonwinner), a repeated measures analysis of variance was employed. These results appear in Table 8. No significant difference in the relative giving to self versus other was revealed.

Insert Table 8 about here

Discussion

One reason frequently given for setting up competitive experiences is that children are enthusiastic about such experiences; they enjoy them. On the other hand, the research cited earlier indicates that at least older students report the cooperative learning environment to be more satisfying. The present research sheds some light on this discrepancy by distinguishing between whether one is a winner or a nonwinner in the competitive learning environment. It was the nonwinners who perceived their learning experience most negatively--as the most boring, the least fun and the least fair, who evaluated their own performance most negatively, and who saw their writing teacher do likewise. However, while nonwinners in the study differed from group winners on these last two dimensions they differed from the winners in the competitive situation on a larger number of dimensions and to a greater extent. Thus, whether one views one's competitive learning experience as satisfying clearly depends on whether one sees oneself as a winner. As the comparison of variances suggest, the competitive winners were almost unanimously

fully satisfied with their experiences.

One significant difference between cooperative boy winners and competitive boy winners, that competitive winners viewed the experience as less boring, suggests another reason for the prevalent opinion that children are enthusiastic about competitive situations. Competition appears to be one way of adding excitement for boys to an otherwise dull situation. In addition, although both winners and nonwinners competed it was only the winners who viewed the situation as exciting.

Data from the evaluation questionnaire also indicates how powerful the adult's judgment of worth is in determining how a child sees his own performance. Since children were randomly chosen to be "winners" in the competitive situation it is reasonable to assume there were no differences in actual quality of stories between winners and nonwinners. Yet there was a significant difference between girl competition winners and nonwinners in how they viewed their work.

Finally, it is clear by the responses to the evaluation questionnaire that the conditions took, responses of children varied by condition. This was particularly clear with respect to teacher evaluation, a variable directly manipulated experimentally.

Self-reward data is partially congruent with hypotheses. Nonwinning males in the competitive condition self-rewarded more than females in the same condition, although not significantly more than winning males in the competitive condition. However, this same pattern of males self-rewarding more than females was found in the cooperative winning condition as well. It was suggested earlier that for the nonwinners the differences in self-reward between males and females could be interpreted to mean that the males were engaged in self-therapy. It was also hypothesized that cooperative winners

would self-reward less than competitive winners because achievement without outdoing another is viewed as less of a success. But is it possible that boys engage in self therapy when they participate as a group and win? Data from the evaluation questionnaire indicate that it is indeed possible.

In the cooperative condition males viewed their experiences as less fair than females. Furthermore males, but not females, in both the cooperative winning and competitive nonwinning conditions perceived their experiences as less fair than males in the competitive winning condition. These data suggest that the affect the males experienced was anger at what they perceived to be unfair treatment, and that high self reward was an attempt to even up the score. This interpretation is congruent with the findings of Rosenhan, Underwood and Moore (1974) where males who experienced negative affect (often anger) self-gratified more than males who experienced positive affect.

In addition to the notion of fairness, the experimental conditions elicited more differentiated affective responses from males than females. For males but not females, competition winners viewed their learning experiences as less boring than either cooperation winners or competition nonwinners. Again for males but not females, competition winners perceived their experiences as more fun than competition nonwinners. That the cooperation condition and the competition nonwinning condition generates more negative affect for boys than girls supports the common notion that boys have been more competitively socialized than girls. This is most strongly supported when we note the negative affect experienced by boys in a cooperative winning condition.

Another explanation of the observed self-reward differences, focusing on females rather than males, is suggested by the prizes to self minus prizes to others analyses. While males in the competitive nonwinner condition gave high self reward relative to other reward, females gave low self reward relative

to other reward, and those females differed significantly from females in the competitive winner condition. Since this latter difference exactly parallels the evaluative feedback of the E to the subjects, it seems reasonable to argue that the females accept the teacher's evaluation and make it the basis of their own self-evaluation. Thus, their low self-reward relative both to what they give others and what boys give self simply reflects their own low self-evaluation relative to boys. The data on self-evaluation is consistent with this interpretation. In the competitive nonwinning condition boys have higher self-evaluations than girls, evaluations that do not differ significantly from the self-evaluations of male competitive winners. Girls, on the other hand, have significantly lower self-evaluations in the competitive nonwinning than in the competitive winning condition. Girls appear to base prize giving to self and others on a particular kind of "norm of deservedness." In a competitive situation where one does not win, others are more "deserving" than self. But if one is a winner in a competitive situation, one is more "deserving" than others. Cooperative winners perceive all three classmates (including self) as about equally deserving and consequently give about the same to self as to others. This interpretation of female prize giving emphasizes the influences of a cognitive process rather than an affective process. Prize giving in this situation appears to be a judgment of what one deserves relative to others in varying situations.

That cooperative winning situations are viewed as less fair than competitive winning situations indicates something about the definition of success held by the males in this sample. It suggests that in order to experience success males must be singled out for special recognition. Doing well is not sufficient: one must be better than someone else.

It is clear from this study that the effects of "failure" and of "success" depend on a number of variables other than simply the amount of reward received, for example, on whether one sees the reward as deserved and the distribution of rewards as fair. One goal for future research in this area is to define these modifying circumstances more specifically. A related goal should be exploration of the specific nature of "self-therapy," a term that has many possible meanings. For example, it may be telling yourself you are an o.k. person if you performed poorly on a specific task or telling yourself that you really have done well or deserve better than your negative experiences (e.g., external feedback) indicate. The latter appears to be what the males in this study engaged in.

References

Bandura, A. & Whalen, C. K. The influence of antecedent reinforcement and divergent modeling cues on patterns of self-reward. Journal of Personality and Social Psychology, 1966, 3 (4), 373-382.

Barry, H., Bacon, M. K. & Child. I. L. A cross-cultural survey of some sex differences in socialization. Journal of Abnormal and Social Psychology, 1957, 55, 327-332.

Bryant, B., Crockenberg, S., & Wilce, L. The educational context for the study of cooperation and helpful concern for others. Paper presented at the annual meetings of the American Educational Research Association, Chicago, April, 1974.

Crockenberg, S. & Bryant, B. Helping and sharing behavior in cooperative and competitive classrooms. Paper presented at the biennial meetings of the Society for Research in Child Development, Philadelphia, March 1973.

Deutsch, M. An experimental study of the effects of cooperation and competition upon group process. Human Relations, 1949, 2, 199-231.

Deutsch, M. Cooperation and trust: Some theoretical notes. In M. R. Jones (Ed.), Nebraska Symposium on Motivation. Lincoln, Nebraska: University of Nebraska Press, 1962, 275-320.

DeVries, D. L. & Edwards, K. J. Learning games and student teams: Their effects on classroom processes. Center Report #142, Center for Social Organization of Schools, Johns Hopkins University, 1972.

Haines, D. B. & McKeachie, W. J. Cooperation versus competitive discussion methods in teaching introductory psychology. Journal of Educational Psychology, 1967, 58, 386-390.

Horner, M. Femininity and successful achievement: A basic inconsistency. In M. H. Garskof (Ed.) Roles women play: Readings toward women's liberation. Belmont, California: Brooks/Cole Publishing Company, 1971.

Johnson, D. W. Student attitudes toward cooperation and competition in a mid-western school district. Unpublished report, University of Minnesota, 1973.

Naught, G. M. & Newman, S. F. The effect of anxiety on motor steadiness in competitive and non-competitive conditions. Psychonomic Science, 1966, 6, 519-520.

Rosenhan, D. L., Underwood, B. & Moore, B. Affect moderates self-gratification and altruism. Journal of Personality and Social Psychology, 1974 (in press).

Sears, R. R., Maccoby, E. & Levin, H. Patterns of child rearing. Stanford: Stanford University Press, 1965.

Table 1

Evaluation Questionnaire

Item(s)		Cooperation Winner (n=57)	Competition Winner (n=40)	Competition Nonwinner (n=80)
Total score	mean	24.28	25.45	22.69
	s.d.	3.14	2.07	3.23
Boring	mean	3.81	3.98	3.76
	s.d.	.40	.16	.51
Fun	mean	3.47	3.78	3.36
	s.d.	.85	.42	.80
Easy	mean	3.77	3.73	3.61
	s.d.	.42	.45	.63
Pleasant	mean	3.44	3.65	3.38
	s.d.	.78	.48	.80
Fair	mean	3.44	3.70	3.21
	s.d.	.76	.52	.92
My work good	mean	3.16	3.22	2.74
(self evaluation)	s.d.	.82	.73	.91
Teacher thought my work good	mean	3.19	3.40	2.63
(teacher evaluation)	s.d.	.79	.81	.91

Table 2

Analyses of Variances

Total Evaluation Score	F	df	p
Cooperation winner vs. Competition winner	2.30	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.03	(79,56)	n.s.
Competition nonwinner vs. Competition winner	2.44	(79,39)	.01
"My class was boring"			
Cooperation winner* vs. Competition winner	6.15	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.62	(79,56)	n.s.
Competition nonwinner vs. competition winner	10.00	(79,39)	.01
"My class was fun"			
Cooperation winner vs. Competition winner	4.00	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.12	(79,56)	n.s.
Competition nonwinner vs. Competition winner	3.56	(79,39)	.01
"My class is pleasant"			
Cooperation winner vs. Competition winner	2.65	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.05	(79,56)	n.s.
Competition nonwinner vs. Competition winner	2.78	(79,39)	.01
"My class is easy"			
Competition winner vs. Cooperation winner	1.11	(39,56)	n.s.
Competition nonwinner vs. Cooperation winner	2.22	(79,56)	.01
Competition nonwinner vs. Competition winner	2.00	(79,39)	.01
"My class was fair"			
Cooperation winner vs. Competition winner	2.15	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.48	(79,56)	n.s.
Competition nonwinner vs. Competition winner	3.15	(79,39)	.01

Table 2 (continued)

"I thought my work was good"			
Cooperation winner vs. Competition winner	1.26	(56,39)	n.s.
Competition nonwinner vs. Cooperation winner	1.22	(79,56)	n.s.
Competition nonwinner vs. Competition winner	1.55	(79,39)	n.s.
"My teacher would have given me a 'good' grade"			
Competition winner vs. Cooperation winner	1.26	(39,56)	n.s.
Competition nonwinner vs. Cooperation winner	1.55	(79,56)	n.s.
Competition nonwinner vs. Competition winner	1.24	(79,39)	n.s.

*In all cases, the larger of the two variances being compared is listed on the left side of the comparison.

Table 3

Evaluation Questionnaire: Kruskal-Wallis Tests

Item	Source	H	df	p
Total Score	Condition	18.48	2	.001
	Sex	.00	1	--*
	Interaction	3.05	2	--
Boring	Condition	7.94	2	.02
	Sex	1.58	1	--
	Interaction	31.42	2	.001
Fun	Condition	6.76	2	.05
	Sex	1.40	1	--
	Interaction	14.98	2	.001
Easy	Condition	2.10	2	--
	Sex	4.88	1	.05
	Interaction	17.05	2	.001
Pleasant	Condition	2.79	2	--
	Sex	1.19	1	--
	Interaction	11.90	2	.01
Fair	Condition	8.26	2	.02
	Sex	8.06	1	.01
	Interaction	6.98	2	.05
My work good (self-evaluation)	Condition	9.86	2	.01
	Sex	6.57	1	.02
	Interaction	7.46	2	.05
Teacher thought my work good (teacher evaluation)	Condition	20.50	2	.001
	Sex	4.46	1	.05
	Interaction	.05	2	--

*$p > .05$

Table 4

Mean Number of Prizes Given Self

	Condition			
Sex of Subject	Cooperation Winners	Competition Winners	Competition Nonwinners	X
Male	7.47	6.60	7.93	7.48
Female	5.57	7.25	5.80	6.04
X	6.52	6.93	6.86	

Table 5

Analysis of Variance: Number of Prizes Given Self

Source	SS	df	MS	F	p
Condition	5.36	2	2.68	0.36	
Sex	52.57	1	52.57	7.00	.01
Interaction	65.79	2	32.89	4.38	.05
Error	1306.56	174	7.51		

Table 6

Means of Difference Scores

(Prizes to Self Minus to Other)

Sex of Subject	Cooperation Winners	Competition Winners	Competition Nonwinners	
			Re: Winners	Re: Nonwinners
Male	2.6	.9	2.2	2.5
Female	.2	1.0	-1.2	-.5

Table 7

Analysis of Variance: Difference Scores

(Prizes to Self Minus to Other)

Source	SS	df	MS	F	p
Condition	26.54	2	13.27	1.46	
Sex	150.39	1	150.39	16.55	.01
Interaction	80.97	2	40.49	4.45	.05
Error			9.09		

Table 8

Analysis of Variance: Difference Scores of Competition Nonwinners (Prizes to Self Minus to Other)

Source	SS	df	MS	F	p
Sex (A)	403.22	1	403.22	24.81	.001
Subject (B)	1267.75	78	16.25	0.00	
Difference Score (C)	8.10	1	8.10	1.38	
AC	1.60	1	1.60	0.27	
BC	458.30	78	5.88	0.00	
Error	0.00	0	0.00		
Total	2138.98	159			

Footnotes

1. Appreciation is extended to Keith Barton for his statistical assistance.

Requests for reprints should be sent to Susan Crockenberg, Department of Applied Behavioral Sciences, University of California, Davis, California 95616.

2. The authors wish to express gratitude to the Elk Grove School District for their cooperative participation in this research.

3. Prior to administering these measures the E gave the Paired-Hands task and wrote the reports to the teachers. Early in the research it was decided that the Paired-Hands task was not providing useful information. However, rather than discard it and thereby alter the timing of the experiment it was continued. Together these two activities took approximately twenty minutes.

4. A copy of the questionnaire and exact wording for administering all post-experimental measures can bbtained from the authors upon request.

5. This presentation does not report findings on the toy take-away task as they were reported in Bryant, Crockenberg, & Wilce (1974).